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MANUAL OF OPERATION
MODEL 2910D
DATA TEST SET PRINTER

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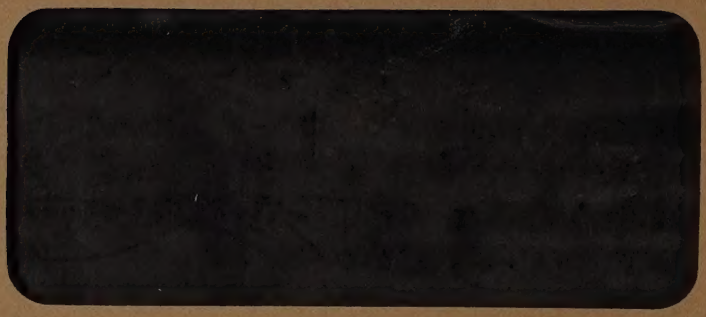

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INTERNATIONAL DATA SCIENCES, INC.

ADVANCED TECHNIQUES IN DATA COMMUNICATIONS

MANUAL OF OPERATION
MODEL 2910D
DATA TEST SET PRINTER

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1.0 INTRODUCTION

1.1 General

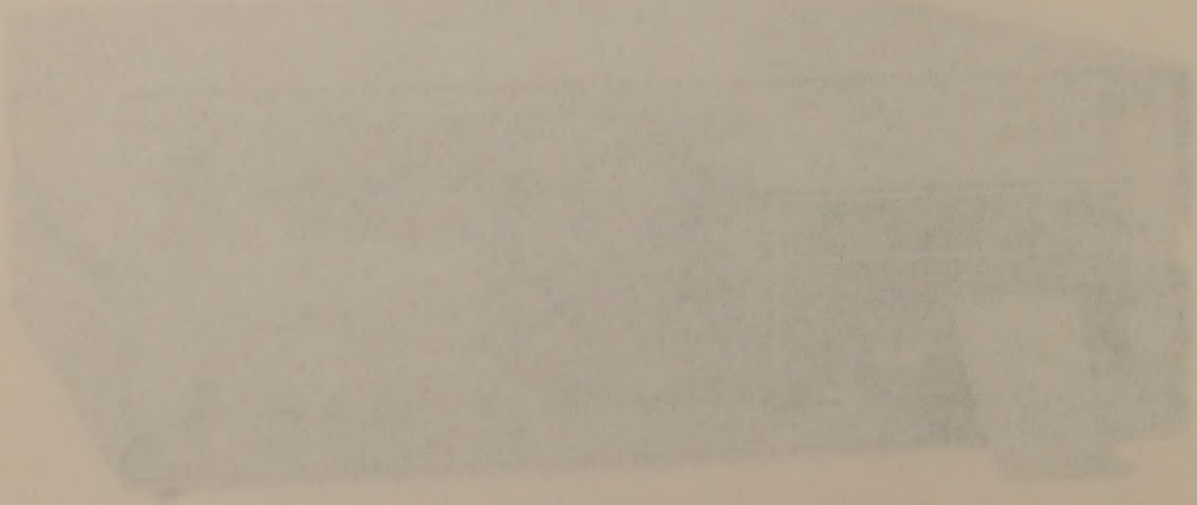
The Model 2910D Data Test Set Printer shown in Figure 1-1 is designed to operate with an IDS Model 3000D or 3000E Data Transmission Test Set to provide a permanent record of test results. It can be used to obtain an unattended record of failures of critical signals in the various data interfaces under test.

Features of the Model 2910D (henceforth referred to as the printer) include a presettable real time clock, seven selectable trigger channels, and thirteen event triggers. Printouts consist of the time the event occurred, a channel identifier, and the contents of the test set's four event counters (Errored Bits, Total Bits, Errored Seconds, and Total Seconds).

The printer is simple to operate. The operator starts the test by selecting the appropriate channels he wishes to record. Printouts are initiated whenever any of the selected events occur. Trigger channel input signals are stored to allow printouts of two events that occur simultaneously.

The following sections of this manual provide information on the installation and operation of the printer.

Figure 1-1. IDS Model 2910D Data Test Set Printer



1.2 Technical Specifications

1.2.1 Dimensions

a) Desktop - Height: 5¼ inches (13.4 cm)
Width: 16 inches (40.6 cm)
Depth: 12½ inches (31.8 cm)

b) Rack Mount (option) - Height: 5¼ inches (13.4 cm)
Width: 19 inches (48.3 cm)
Depth: 12 inches (30.5 cm)

1.2.2 Weight

The printer weighs approximately 16 pounds, (7.26 Kg) uncrated.

1.2.3 Power Requirements

The printer requires 115 VAC, 60 Hz ±10% power input. Internal protection is provided by a 1 Amp, SB fuse. For 230 VAC, 50 Hz operation, an optional factory modification is required. Power consumption is approximately 106 watts, maximum.

1.2.4 Environmental Conditions

a) Operating Temperature: 0^{o} - 50^{o}C
b) Relative Humidity: 90% non-condensing.

1.2.5 Print Format

a) Paper: Thermographic, 1 3/4" wide x 150' long.
b) Print Speed: 3 lines per second.
c) Characters: 5/32" high x 5/64" wide (0.394 cm H x 2.03 cm W).
d) Line Spacing: 5 lines per inch (0.254 cm).
e) Column Spacing: 13/64 inches (0.508 cm) per column.
f) Paper Warning: F-E scale on printer panel.

1.2.6 Input Voltage Levels

DTL/TTL compatible - High: 2.4 - 5.5 volts; Low: 0 - 0.4 volts.

1.3 Options

Table 1-1 lists and describes options available for the printer. Additional information is provided in Section 4.0.

TABLE 1-1. OPTIONS

Option	Description
230 VAC Operation	Allows printer to operate from a 230 VAC, 50 Hz power source.
Rack Mount	Allows unit to be mounted in a standard 19-inch cabinet.

2.0 INSTALLATION

2.1 General

This section provides information required to perform both the mechanical and electrical installation requirements. Service personnel should become familiar with all installation procedures before attempting to install the printer. Upon completion of all installation requirements, refer to Section 3.0 for power-up and operation procedures.

2.2 Site Preparation

The installation area should be clean, well lighted, and free from extremes of temperature, humidity, appreciable shock, and vibration. The printer should be installed within six (6) feet of a grounded AC outlet capable of furnishing primary power as specified in paragraph 1.2.3. Allow three (3) feet of front clearance for installation and maintenance and a minimum of three (3) inches at the rear for cable clearance and air flow.

2.3 Unpacking and Inspection

Before unpacking the printer, inspect the packing container for unusual damage. Then unpack the unit and inspect it for external damage such as scratches or dents and broken controls, indicators, and connectors. If physical damage is present, retain the packing material and contact the carrier immediately. Each unit has been thoroughly inspected prior to shipment.

2.4 Tools/Equipment/Materials Required

No special tools or equipment are required to install the printer. Any standard field service tool kit can be used.

2.5 Mechanical Installation

The printer is a free-standing unit equipped with plastic feet designed for placement on a shelf or table top. The unit has no provisions for securing it to the mounting surface.

2.6 Electrical Installation

2.6.1 AC Power Cord

AC power is supplied to the printer through a removable 6-foot line cord with a grounded 3-wire plug (Belden Part No. 17237-S). The line cord mates with a receptacle at the rear of the unit (see Figure 2-1). Power requirements are specified in paragraph 1.3.3.

2.6.2 Data Test Set Interface

A male, 37-pin connector located on the rear panel provides the interface to allow for the interconnection of an IDS Model 3000D or 3000E Data Transmission Test Set. The interface pin assignments are listed and described in Table 2-1.

Figure 2-1. Rear Panel Connectors

TABLE 2-1. DATA TEST SET INTERFACE DESCRIPTION

Pin Number	Signal Name	Signal Flow	Description
1	Not Used		
2	Errored Seconds	To Printer	A negative going pulse for each detected Errored Second.
3	Receive Clock (SCR)	To Printer	A normally low signal which goes high when the receiver clock input to test set is absent.
4	BCD bit 800	To Printer	BCD data output of either Errored Seconds, Total Seconds, Errored Bits, or Total Bits. The output selected is controlled by printer input commands as described on Pins 26, 27, 28, and 29 of this connector. These outputs are negative true. A five-volt signal is a logic zero and a zero-volt signal is a logic one.
5	BCD bit 400	To Printer	
6	BCD bit 100	To Printer	
7	BCD bit 200	To Printer	
8	BCD bit 40	To Printer	
9	BCD bit 80	To Printer	
10	BCD bit 10	To Printer	
11	BCD bit 20	To Printer	
12	BCD bit 4	To Printer	
13	BCD bit 8	To Printer	
14	BCD bit 2	To Printer	
15	BCD bit 1	To Printer	
16	BCD Data Autorange Bit 1	To Printer	Negative true BCD coded.
18	BCD Data Autorange Bit 2	To Printer	Autorange Data 00 = No power of 10 01 = BCD output times 10 10 = BCD output times 100 11 = BCD output times 1000 For Total Bits 00 = BCD output times 10^4_5 01 = BCD output times 10^6_7 10 = BCD output times 10^7 11 = BCD output times 10^7
17	Reset Count	From Printer	A high to low pulse resets all the displays' counters.
19	Sync Recovered	To Printer	Normally high (5V) signal which goes low (0V) when test set recovers sync.
20	Not Used		
21	Signal Ground		

TABLE 2-1. DATA TEST SET INTERFACE DESCRIPTION (continued)

Pin Number	Signal Name	Signal Flow	Description
22	Not Used		
23	Not Used		
24	Sync Lost	To Printer	Normally high (5V) signal to indicate that test set is in sync. This signal goes low when the Model 3000D is out of sync.
25	Frame Ground		
26	Errored Seconds Select	From Printer	A high requests Errored Second BCD Data at output connector.
27	Total Seconds Select	From Printer	A high requests Total Bits BCD Data at output connector.
28	Errored Bits Select	From Printer	A high requests Errored Bits BCD Data at output connector.
29	Total Bits Select	From Printer	A high requests Total Bits BCD Data at output connector.
30	Receive Data (RD)	To Printer	Normally high, goes low if no RD is detected.
31	Clear to Send (CTS)	To Printer	Normally high, goes low if no CTS is detected.
32	Data Set Ready (DSR)	To Printer	Normally high, goes low if no DSR is detected.
33	Serial Clock Transmit (SCT)	To Printer	Normally low, goes high if no SCT is detected.
34	Signal Quality/Automatic Gain Control (SQ/AGC)	To Printer	Normally low, goes high if no SQ/AGC is detected.
35	Ring Indicator (RI)	To Printer	Normally low, goes high if no RI is detected.
36	Data Carrier Detect (DCD)	To Printer	Normally high, goes low if no DCD is detected.

3.0 OPERATION

3.1 General

This section describes all front panel controls and indicators, and provides information on power-up and operation procedures. The operator should become familiar with this information before attempting to operate the printer.

3.2 Controls and Indicators

Front panel controls and indicators are shown in Figure 3-1 and described in the following paragraphs.

3.2.1 Time Preset

The Time Preset allows the real time clock to be set to the time of day. It consists of four pushbutton switches labeled HOUR: TENS and UNITS; and MINUTE: TENS and UNITS. The internal time clock is synchronized to the 60 Hz line frequency.

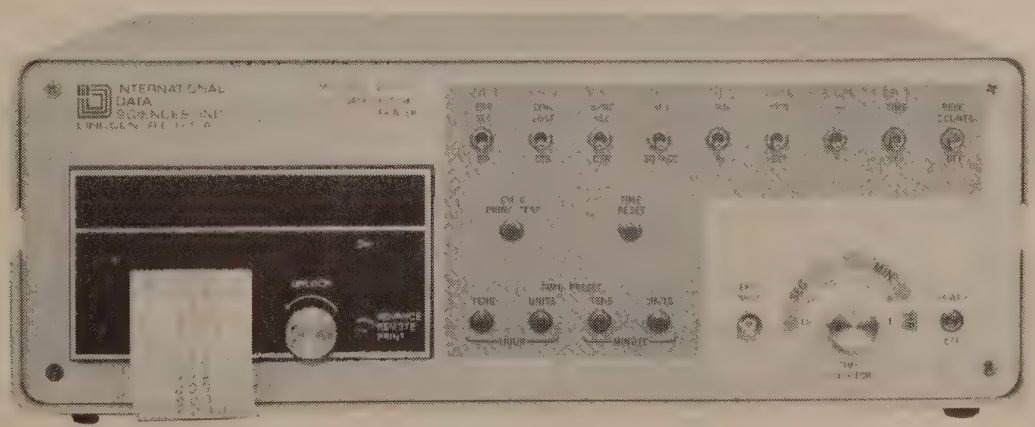


Figure 3-1. Front Panel Controls and Indicators

3.2.1 Time Preset (continued)

Each time a switch is pressed, that time location will advance one unit. The counter is designed to overflow from units (minutes) to tens (minutes) to units (hours) to tens (hours). For example, to preset the timer to 12:45: depress the MINUTE/UNITS pushbutton 5 times, and the MINUTE/TENS pushbutton 4 times; then depress the HOUR/UNITS 2 times, and the HOUR/TENS once.

3.2.2 Time Reset

This pushbutton resets the real time clock.

3.2.3 Channel 0

This pushbutton initiates one complete print cycle when depressed. The channel identifier is the Number 0.

3.2.4 Channel 1

This three-position toggle switch selects either Errored Seconds (ERR SEC) or Receive Data (RD) as the trigger input. When in the center position, no CH 1 event will initiate a print cycle.

3.2.5 Channel 2

This three-position toggle switch selects either SYNC LOST or Request to Send (RTS) as the trigger input. When in the center position, no CH 2 event will initiate a print cycle.

3.2.6 Channel 3

This three-position toggle switch selects either Sync Recovered (SYNC REC) or Data Set Ready (DSR) as the trigger input. When in the center position, no CH 3 event will initiate a print cycle.

3.2.7 Channel 4

This three-position toggle switch selects either Serial Transmit Clock (STC) or Signal Quality/Automatic Gain Control (SG/AGC) as the trigger input. When in the center position, no CH 4 event will initiate a print cycle.

3.2.8 Channel 5

This three-position toggle switch selects either Serial Clock Receive (SCR) or Ring Indicator (RI) as the trigger input. When in the center position, no CH 5 event will initiate a print cycle.

3.2.9 Channel 6

This three-position toggle switch selects either Data Carrier Detect (DCD) or an external (EXT) signal as the trigger input. When in the center position, no CH 6 event will initiate a print cycle.

3.2.10 Slope

This two-position toggle switch selects either the positive (+) or negative (-) slope of the external input signal as the trigger input. This switch is disabled when Channel 6 is switched to the DCD position.

3.2.11 Channel 7

This two-position toggle switch enables a periodic printout of test results as set by the Time Selector rotary switch.

3.2.12 Reset Counts

This two-position toggle switch resets all counters in the test set and operates only when CH6/EXT or CH 7 is enabled.

3.2.13 F/E Scale

The full (F)/empty (E) scale located on the printer mechanism provides a visual indication of the paper supply. An internal micro-switch disables printer operation when paper supply is depleted.

3.2.14 Advance/Remote/Print

This three-position toggle switch controls operation of the printer mechanism. When held in the ADVANCE position, the printer will continuously advance the paper without printing. When held in the PRINT position, the printer will print one line for test purposes and stop. The REMOTE position enables normal operation.

3.2.15 External Input

The BNC input labeled EXT may be used to trigger CH 6 (when EXT is selected) using an external TTL signal source.

3.2.16 Time Selector

This rotary switch selects the time intervals that a periodic printout will be triggered. Seven print intervals, ranging from ten seconds to one hour, may be selected. A periodic printout is enabled only when CH 7 is switched to the TIME position. To conserve paper, a printout will be enabled only if the value of the Errored Seconds or an externally triggered event has occurred since the previous printout.

3.2.17 Power/Off

This switch energizes the printer and automatically resets the real time clock. An LED located on the printer mechanism indicates power ON.

3.3 Printer Operation

To operate the printer simply set the appropriate trigger events that will initiate a print cycle, reset the real time clock to the time of day, and power-up. The information printed during each print cycle consists of five lines of data as shown in Figure 3-2. Line one prints the channel identifier and the errored seconds; line two prints the total seconds; line three prints the errored bits; and line four, the total bits. Line five prints the time of the printout.

The trigger events of Channels 1, 2, and 3 are negative-edge-triggered signals; Channels 4 and 5 are positive-edge-triggered signals; and Channel 6 EXT can be switched to trigger on either the positive or negative slope of the BNC input signal. Channel 7 enables the periodic printout as set by the Time Selector.

3.4 Paper Loading

The following is a step-by-step procedure for loading a new roll of paper into the printer:

a) Shut off all power to the printer.

b) Slide out the printer mechanism by first loosening the front panel thumbscrew counterclockwise until it stops. Then pull the thumbscrew firmly straight out, and the printer assembly will slide out. Some force may be needed to release the internal P.C. connection.

c) Remove any paper from the previous roll and pull the remaining paper backward out from under the printhead by pressing down on the printhead release lever (see Figure 3-3).

d) Grasp both ends of the paper roll axle with fingertips and pull straight up out of the printer assembly. The axle will slide past the circular axle retaining spring with little resistance.

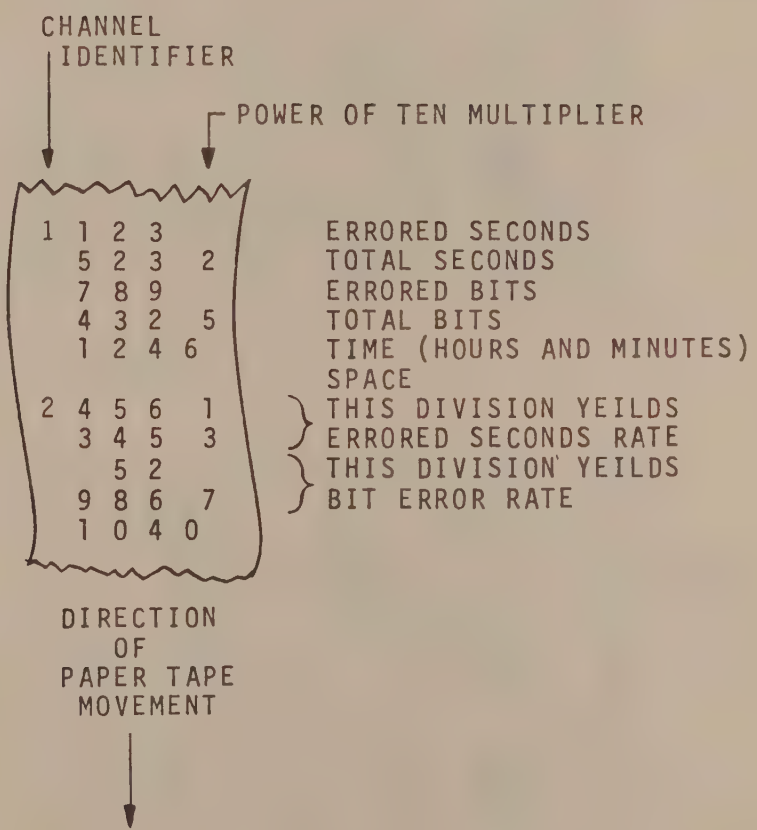
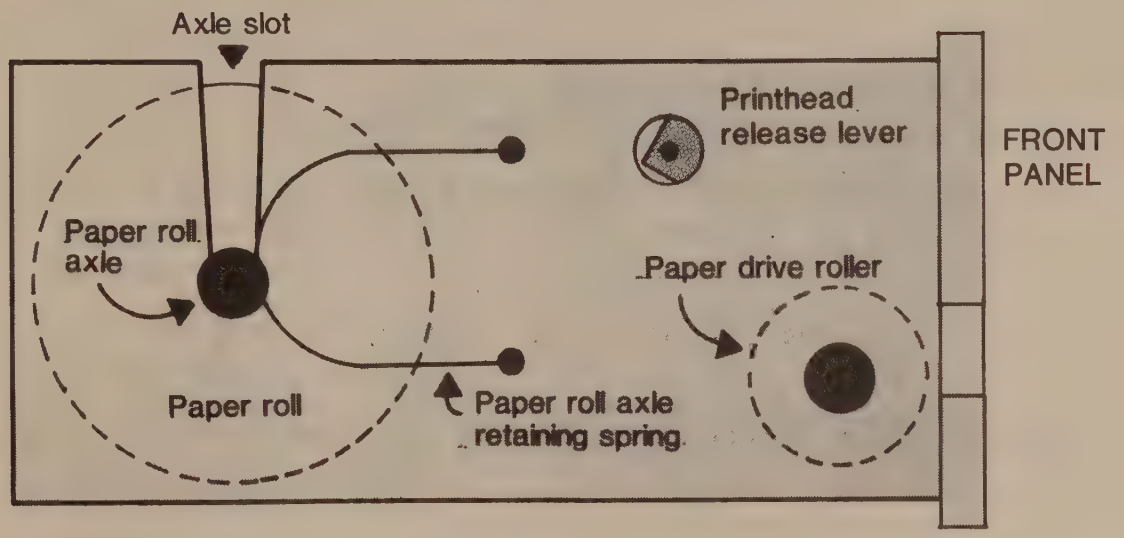


Figure 3-2. Typical Printout



SIDE VIEW

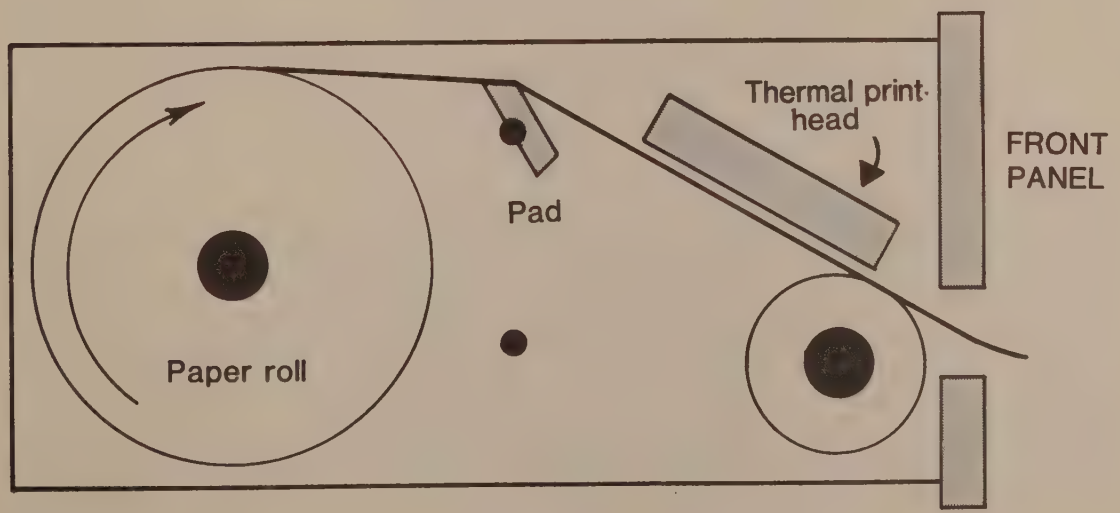


Figure 3-3. Paper Loading

3.4 Paper Loading (continued)

e) Slide the paper roll axle out of the used paper roll and insert into new roll. Do not discard axle!

f) Slide the new roll and the axle past the retaining spring. Be sure the paper is threaded from the rear and passes over the roll; only the outside paper surface is treated for printing.

g) Cut the paper straight across and insert it under the printhead ribbon cable (while pressing down on the printhead release lever) until paper appears at the front slot.

h) Slide the printer assembly back into the housing, pressing firmly to seat the internal P.C. board connection.

i) Rotate the thumbscrew clockwise to lock the printer assembly in place, and power-up.

4.0 OPTIONS

4.1 General

The following paragraphs of this section describe each option available for the printer.

4.2 230 VAC Operation

The printer requires a factory modification to operate from a 230 VAC, 50 Hz power source. When this option is installed, internal protection is provided by a ½ Amp, SB fuse.

4.3 Rack Mount

The printer is available in a rack mount configuration to allow for installation in a standard 19-inch wide cabinet (see Figure 6-1). A rack-mounted printer occupies 5¼ inches (13.3 cm) of vertical space.

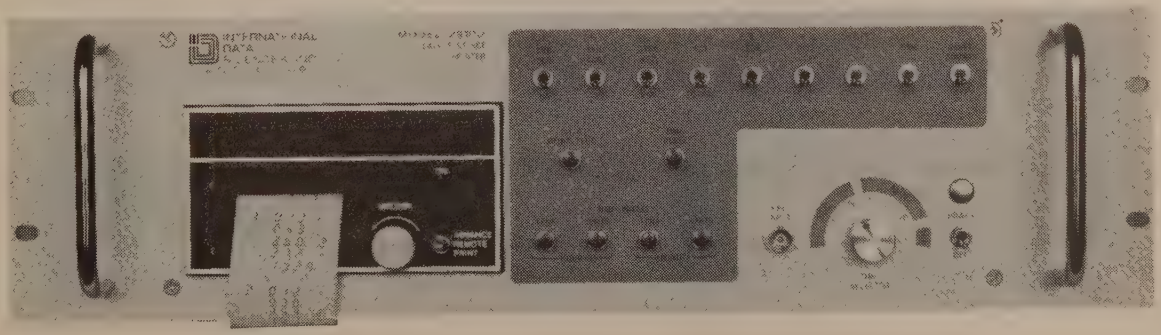


Figure 6-1. Rack Mount Option

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CALIBRATION AND REPAIR SERVICE

All units sold by International Data Sciences, Inc. are calibrated at the time of delivery. International Data Sciences, Inc. recommends a periodic calibration every six months thereafter performed by the Calibration Department at International Data Sciences, Inc. Contact IDS for the cost of each calibration. If the unit requires repairs that are not covered by the original warranty, then IDS will perform the repair at an hourly charge plus parts. Normal turn-around time for calibration is two weeks.

Equipment so calibrated will bear a gummed label on the rear panel identifying the serial number of unit calibrated; the date of calibration, the next recommended calibration date; and the in-plant calibrator identifier.

All units returned to IDS for calibration will be accepted only if transportation charges are prepaid. The purchaser is also responsible for all transportation charges incurred in returning the calibrated unit to the purchaser.

For fast service Federal or Emery Air Freight are recommended. If time is not a problem, UPS is recommended. Return address should be clearly stated and should include a person to the attention of whom unit will be shipped.

Shipping cartons with proper foam packing are available from IDS. The carton will facilitate shipping the equipment to be calibrated with a maximum of protection.

For most expeditious service, when returning the equipment for repair, please fill out the Trouble Report in your Manual of Operation.

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MODEL 2910D TROUBLE REPORT

1) Please indicate what positions the following switches were in:

ERR SEC ___	SYNC LOST ___	SYNC REC ___	SCT ___
CH 1 OFF ___	CH 2 OFF ___	CH 3 OFF ___	CH 4 OFF ___
RD ___	CTS ___	DSR ___	SQ/AGC ___
SCR ___	DCD ___		
CH 5 OFF ___	CH 6 OFF ___	EXT + ___	CH 7 TIME ___
RI ___	EXT ___	- ___	OFF ___

RESET COUNTS ___ TIME SELECTOR 10 sec ___ 20 sec ___ 100 sec ___

OFF ___ 1 min ___ 10 min ___ 20 min ___ 1 hour ___

2) Please give a description of how the printer was being used and its malfunction.

3) Please give mane, address, and telephone number of the person to contact about this unit.

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WARRANTY

All International Data Sciences, Inc. instruments are warranted against defects in material, workmanship, and component failures for a period of ninety days and against defects in material and workmanship for a period of one year. All units returned to IDS under this warranty require prepaid transportation charges. The purchaser is also responsible for all transportation charges incurred in returning the repaired unit to the purchaser.

Instruments to be returned under this warranty require prior authorization by an International Data Sciences, Inc. representative or by the service manager of International Data Sciences, Inc.

International Data Sciences, Inc. reserves the right to make changes in design at any time without incurring any obligation to install same on units previously purchased.

This warranty is expressly in lieu of all other obligations or liabilities on the part of International Data Sciences, Inc., and International Data Sciences, Inc. neither assumes nor authorizes any person to assume for them any other liability in connection with the sales of International Data Sciences, Inc. instruments.

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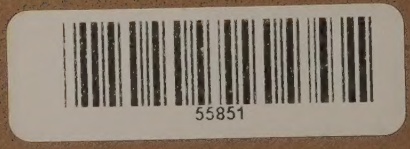

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